CSL overview for ACEs

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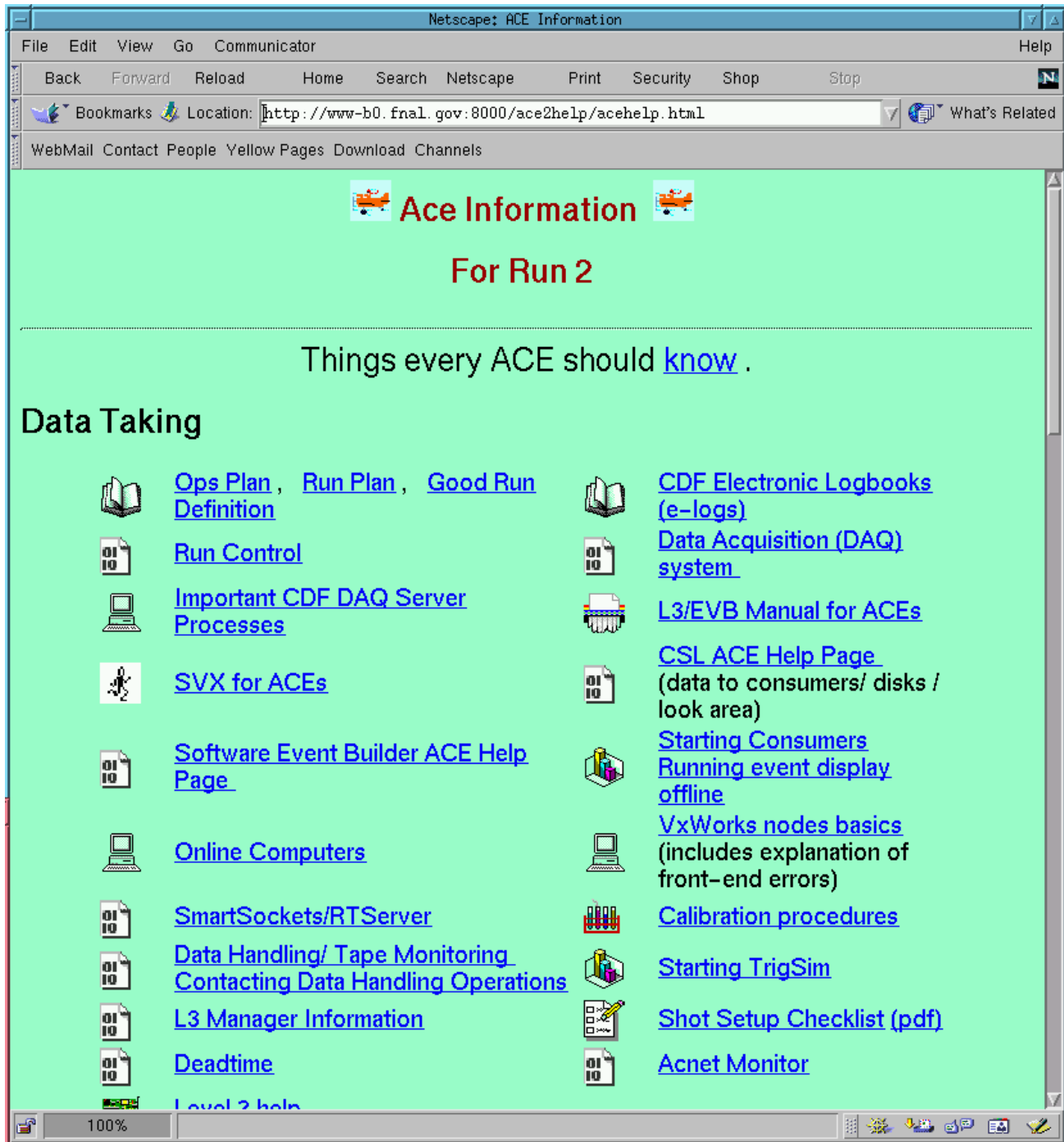
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- CSL description
- monitoring
- troubleshooting

CSL ACE Help Page

Most items in this talk are documented on CSL ACE help page

CSL ACE Help Page

Netscape: Consumer-Server/Logger ACE Help Page

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Bookmarks | Location: http://www-b0.fnal.gov:8000/ace2help/csl/ | What's Related

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About the CSL
Starting/Stopping
Look area
Monitoring
Troubleshooting
Call CSL Expert
CSL Home Page

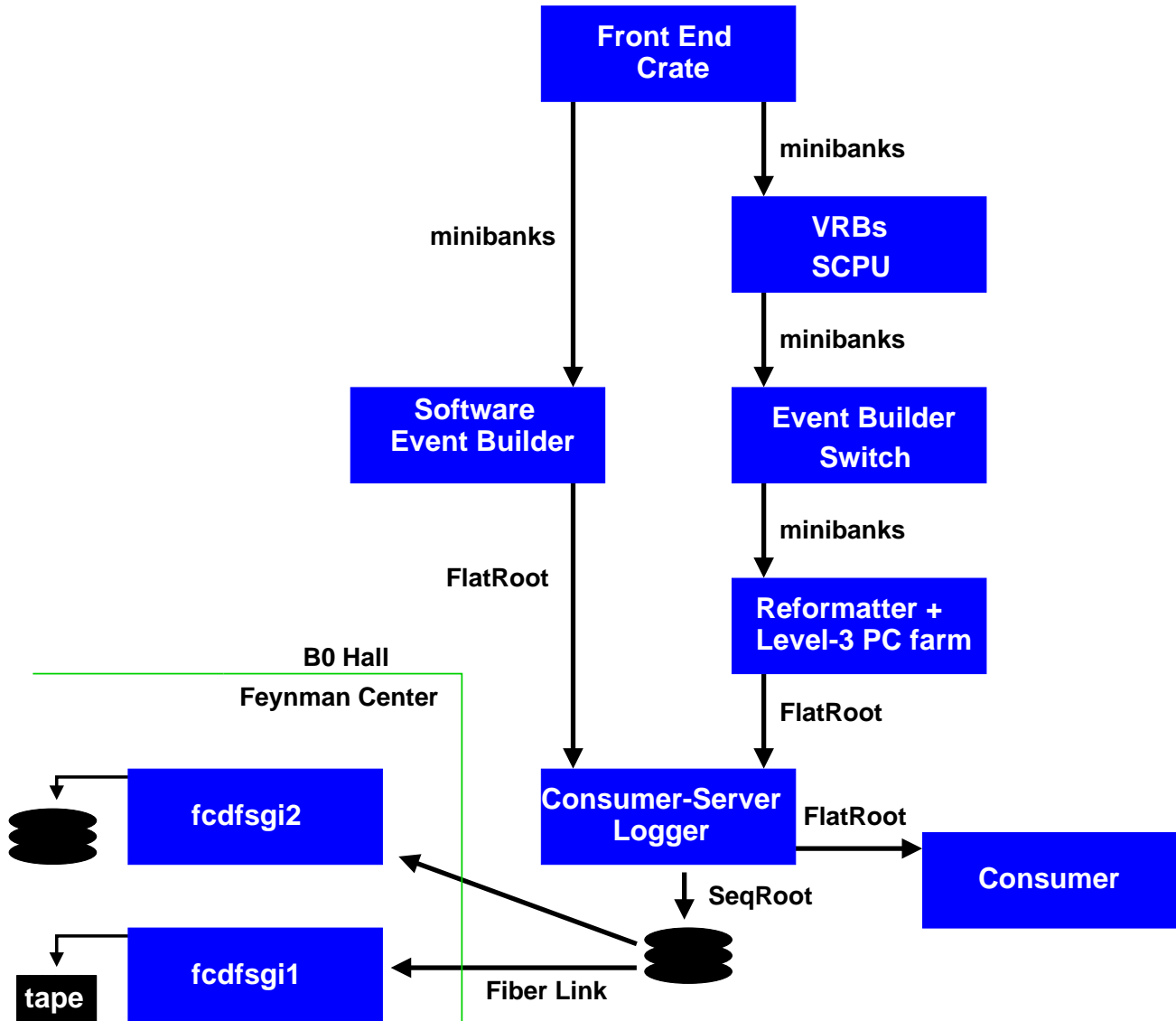## Consumer-Server/Logger ACE Help Page

About the CSL

Questions, comments, suggestions? Send mail to cdf_csl@fnal.gov

The Consumer-Server/Logger (CSL) is the central online hub through which all CDF data taken during Run II must pass. Events passing the Level-3 trigger are written to disk and served to consumers by the CSL. The raw data files on disk are then moved to the Feynman Computing Center (FCC) for further processing. Consumers are online monitoring processes, spying on a fraction of the data passing through the CSL. The diagram below shows how the CSL fits into the overall dataflow.

CSL description

primary CSL functions
- receive events from Level-3 PC farm at 20 MB/sec (75 Hz × 250 kB/event)
- receive events from the software event builder
- write events to disk at ~20 MB/sec
- handle as many consumer requests as possible (5-10 MB/s total)

Starting/stopping the CSL

During normal running, the CSL never needs to be started or stopped. It is always "on", ready to receive events.

The ace is able to start or stop the CSL processes.

The following commands are available:
b0dau32: cslcom stop (stop all CSL processes)
b0dau32: cslcom check (check if CSL processes are running)
b0dau32: cslcom start (start all CSL processes)
b0dau32: cslcom cleanup (kill all CSL processes, normally you don't need to do this)

Whenever start, stop, or cleanup are executed mail is automatically sent to the CSL group. Shift crew should also send a mail to

`cdf_csl@fnal.gov`

describing why the CSL was restarted.

CSL hardware overview

Level-3 network

Level-3 network

fcdfsgi1

b0dau32

b0dau31

unused

fnal.gov

fnal.gov

unused

fnal.gov

hub A

hub B

70 GB
Ciprico

236 GB
Unison   3

270 GB
Digidata   4

270 GB
Unison   5

1   2

670 GB
Digidata   6

370 GB
Ciprico

370 GB
Ciprico

670 GB
Digidata   7

670 GB
Digidata   8

670 GB
Digidata   9
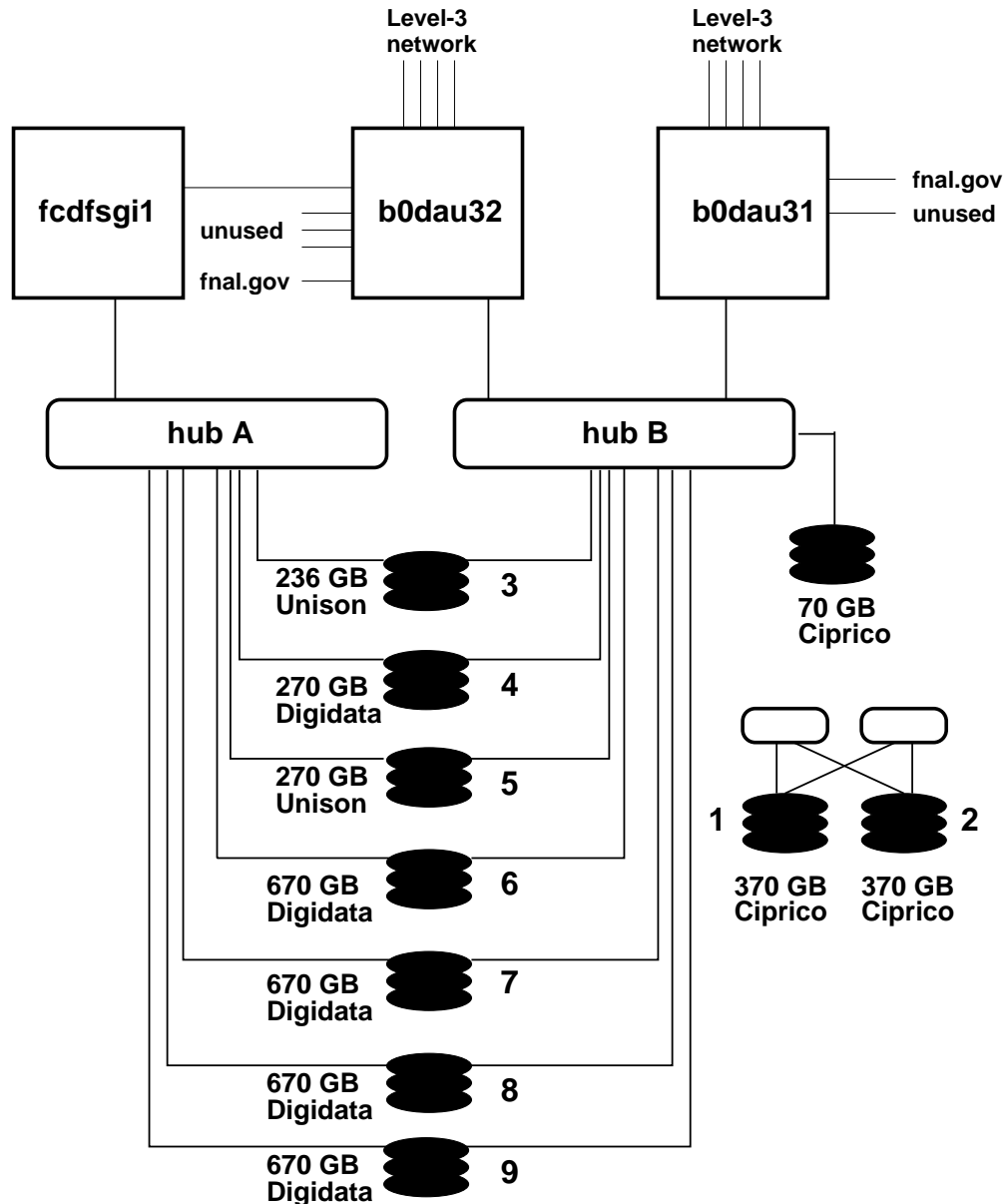
- b0dau32, an SGI 2200 Server
  (4 CPUs, large I/O bandwidth)
  located on third floor of B0
- ~3.5 TB of disk space on third floor of B0 (7 RAIDs)
- dual ported disks allow both fcdfsgi1 in FCC and b0dau32 to
  access disks

CSL software: overview
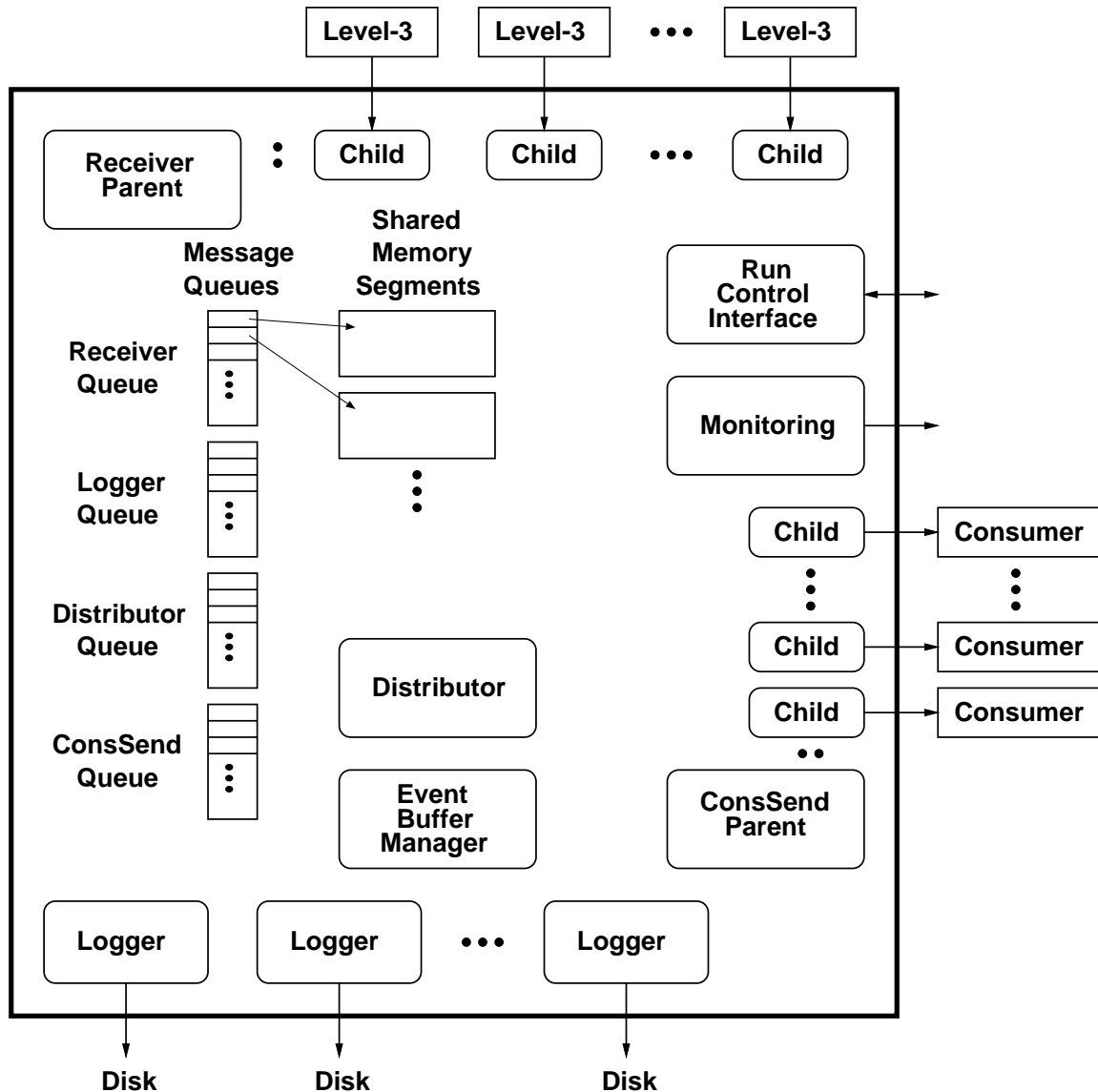
The CSL is a "server". Possible "clients" include

- Level-3 output node processes
- software event builder processes
- 24 hour sender in partition 14
- consumers

Events are stored in shared memory buffers. Flow of events between processes inside CSL achieved by means of message queues.

CSL software: monitoring

The monitoring process collects CSL status information and sends it via a smartsockets message to the CSL monitoring display.

There are two kinds of CSL monitoring:

- the CSL display (snapshot of current CSL state)
- the CSL history plots (show rates, disk space, events logged, etc. versus time)

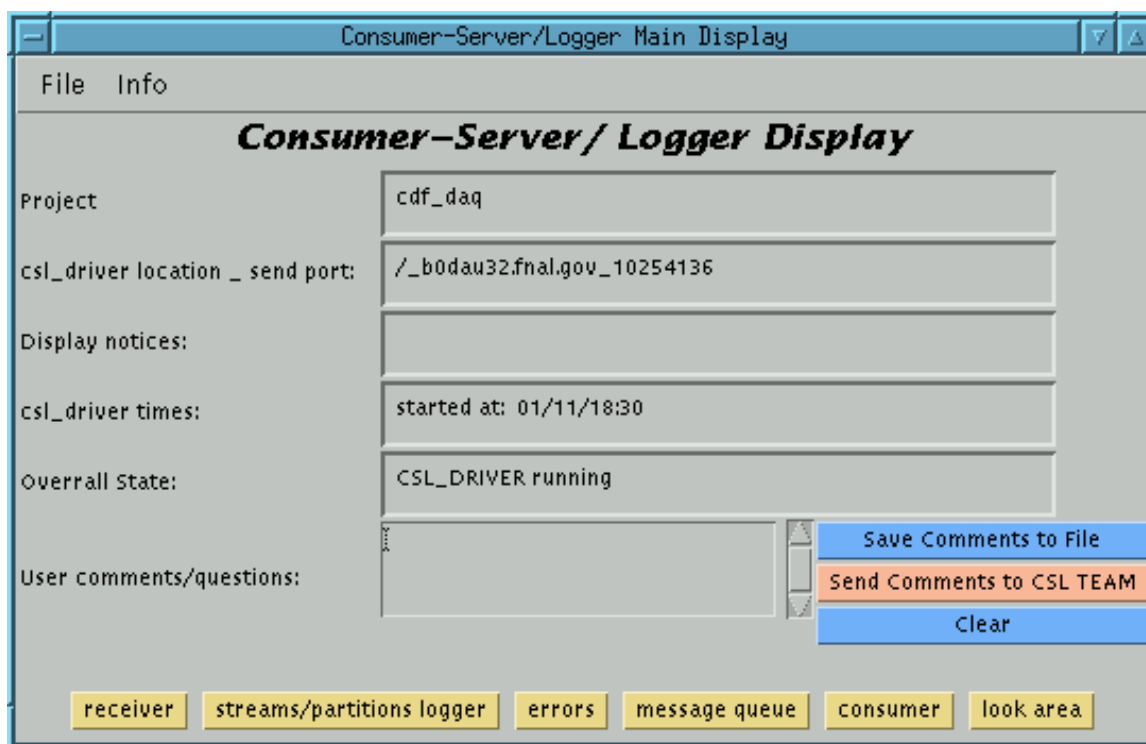Using CSL display to check current CSL status:
login to machine on online cluster
setup fer
daqmon
A GUI should appear on your screen. Click on CSL button.
Use project name cdfdaq (this should be the default). The CSL monitor main display window should appear.

RECEIVER DISPLAY OF EVENTS COMING INTO CSL

File   Info

| Events From | | Statistics | | | Status | | | | | |
Client Name	Partit.	Port #	Inst Rate	Event count	Event size	Activity rate	Unconn	Conn	Idle	Active
b0dap60.fnal.gov	14	1435	0.235	949	0.297	0.0833			(blue)	
b0l3u02c	0	4022	1.3121	242	0.3403	0.0833			(blue)	
b0l3u01c	0	3023	1.3148	236	0.341	0.0667				(red)
b0l3u07d	0	3523	1.2062	233	0.3297	0.0667			(blue)	
b0l3u06c	0	4540	1.3542	207	0.334	0.05			(blue)	
b0l3u04d	0	3452	1.4315	221	0.3367	0.05			(blue)	
b0l3u08d	0	2361	1.2629	220	0.3452	0.0333				(red)
b0l3u05c	0	4349	1.3569	222	0.3347	0.0833				(red)
b0l3u03d	0	4097	1.2023	232	0.3474	0.0167			(blue)	

Total (MB/s) 10.6759   Receivers ending in error 440

Events Received from current clients 2762   **Show average rate**

Events Received from all clients 0   **Show current rate**

For each client sending events to the CSL, there is a receiver process.

The CSL monitoring GUI displays information for each receiver process: client node name, partition, number of events received, and rate.

CSL software: logging

File   Info

Logger Rates for partitions [0–16] and streams [0–10]

Rates shown: Number of Events   Stream definitions

	Part 0	Part 1	Part 2	Part 3	Part 4	Part 5	Part 6	Part 7	Part 8	Part 9	Part 10	Part 11	Part 12	Part 13	Part 14	Part 15
Run Number	136995	0000000	0000000	0000000	0000000	0000000	0000000	0000000	0000000	0000000	0000000	0000000	0000000	0000000	0	0000000
stream A	49	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0	0.00000
stream B	2178	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0	0.00000
stream C	0	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0	0.00000
stream D	0	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0	0.00000
stream E	0	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0	0.00000
stream F	0	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0	0.00000
stream G	491	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0	0.00000
stream H	0	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0	0.00000
stream I	0	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0	0.00000
stream J	532	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0	0.00000
Part totals	3250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total   3250   Overrall Logging counter

Show peak rate   Show average rate   Show current rate   Show number of events   Show event rate

This display is one way to check whether events are being written to disk.
For each partition and each stream this display shows

- the number of events written to disk OR
- the rate of writing events to disk in MB/sec

Modes of running: 4 stream (A,B,G,J), inclusive (only stream I), 8 stream (A,B,C,D,E,G,H,J)

CSL writes events into 1 GB output files onto disks.
CSL disks are temporary holding space for events.
After closing, file sent to FCC where fcdfsgi1 puts it onto tape.
Should be enough disk space for an 8 hour buffer.
First 1 or 2 files of each run go to "look" area on fcdfsgi2.

Paths, datasets, streams in Run 2
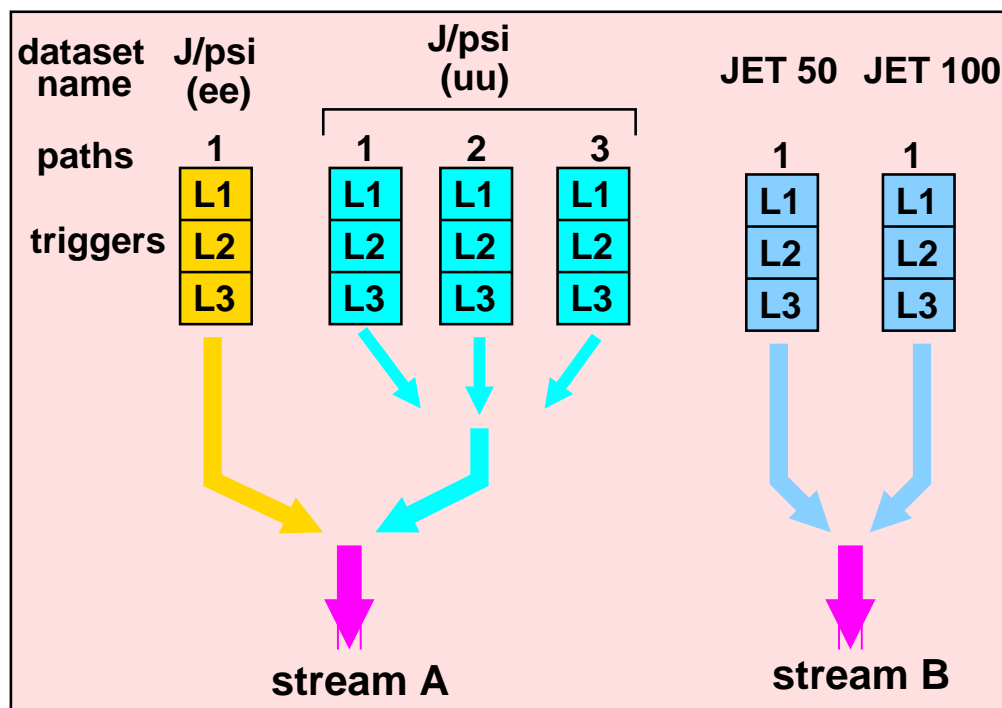
path: AND of Level-1, Level-2, Level-3 triggers.
dataset: OR of all paths defined for that dataset.
stream: collection of datasets

Events coming out of Level-3 are "streamed": tagged as belonging to a particular stream.

- CDF DAQ system can run in multi-partition mode
- each partition is independent of other partitions
- CSL writes events into separate files for different partitions
- CSL writes events corresponding to different streams within a partition into separate files

Run II: 8 streams, 50-100 datasets

CSL software: serving consumers
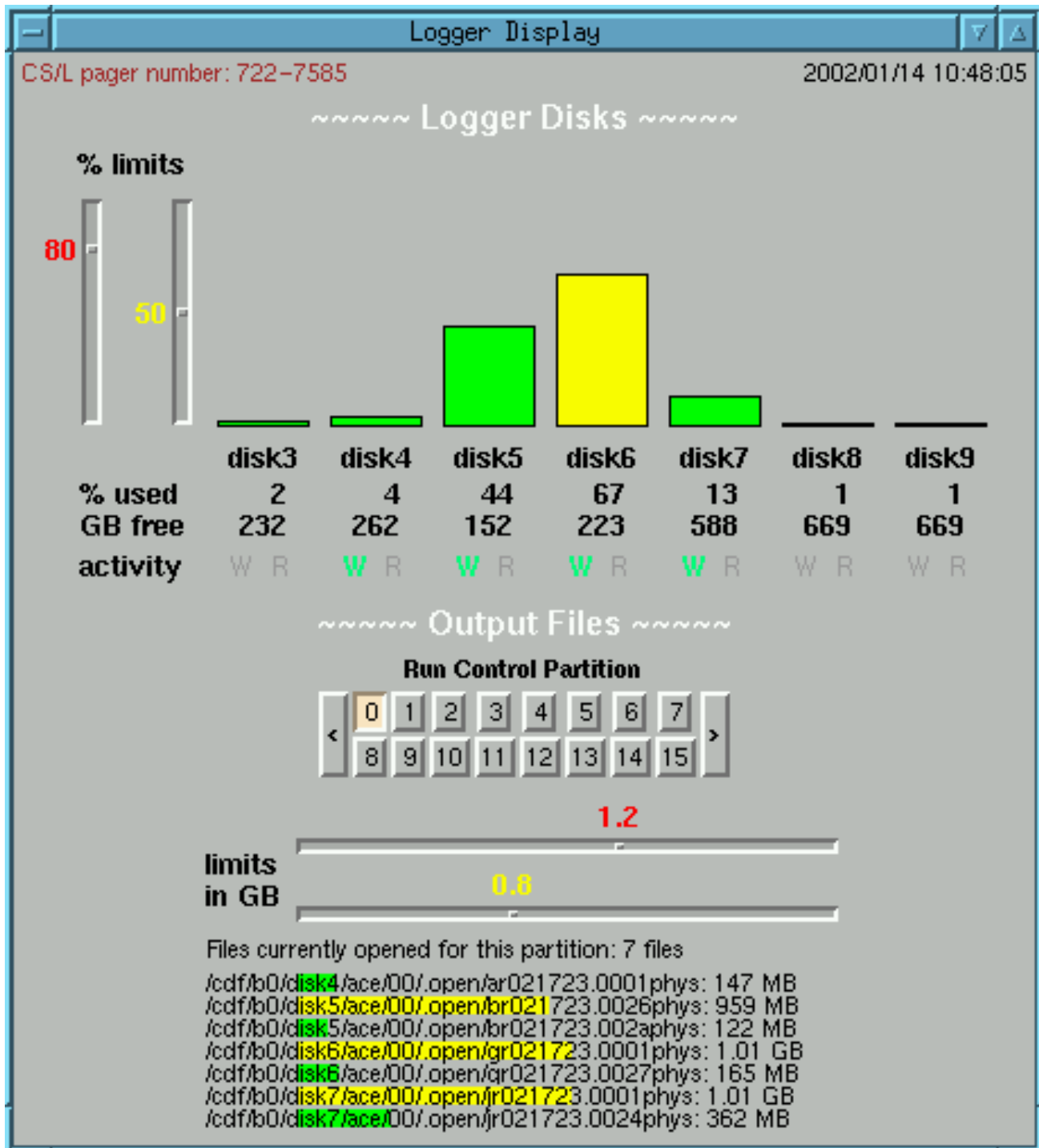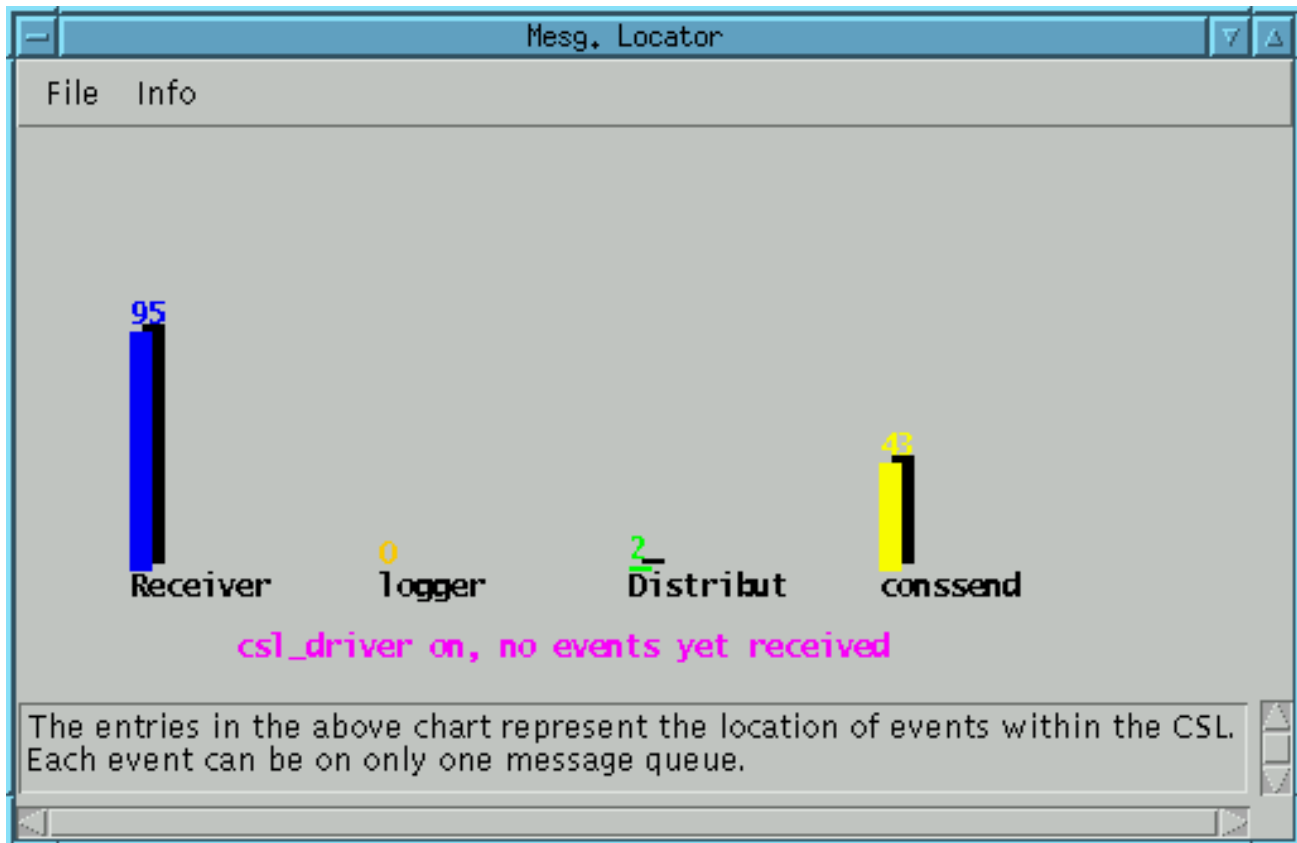

Consumer display

File   Info

Cons. Type	Cons. id / part. id	Host name or address	Evts Req.	Events Recvd	Inst Rate	Conn	Waiting	Active	Complet
DAQMon	28214 / 0	b0dap69.fnal.gov	2502	2501	1.9820185			(red)	
Stage0	28212 / 0	b0dap69.fnal.gov	589	589	0.4119289				(cyan)
SiliMon	25093 / 0	b0dap67.fnal.gov	70	70	0.1095379				(cyan)
SVXMon	27223 / 0	b0dap66.fnal.gov	138	138	0.1098888				(cyan)
ObjectMon	20062 / 0	b0dap56.fnal.gov	2005	2005	1.7567364				(cyan)
BeamMon	27621 / 0	b0dap66.fnal.gov	2449	2448	1.9558252			(red)	
LumMon	18337 / 0	b0dap67.fnal.gov	2520	2520	1.992783				(cyan)
EventDisplay	2429 / 0	b0dap50.fnal.gov	1	1	0				(cyan)
TrigMon	31169 / 0	b0dap52.fnal.gov	591	591	0.4792719				(cyan)
XMon	28354 / 0	b0dap70.fnal.gov	544	544	0.4473012				(cyan)

Events Sent to C.C.   11407

Events Sent to ALL Consumers

Show current rate

CSL LAW #1: write ALL events to disk

CSL LAW #2: send events to consumers as long as it does not break LAW #1

Consumers do not see all events (maybe 5-10 MB/sec). Consumers can request events by partition number, stream, L1/L2/L3 triggers.

CSL Monitoring: disks

Shows how full each CSL disk is, name and size of open files for each partition. This is one way to check that data is being written to disk. (Can also use "findfile runnumber" command on b0dau32.)

CSL Monitoring: message queues


```
Mesg. Locator
File   Info

95
                                                      43

       2
     Receiver        logger       Distribut      conssend
       0
         csl_driver on, no events yet received
The entries in the above chart represent the location of events within the CSL.
Each event can be on only one message queue.
```

There are 150 internal buffers in the CSL. Each buffer can store one event. The display shows four message queues. Each message on a queue points to a buffer where an event may be stored.

Receiver (left, blue) queue shows how many buffers are free to store new events from Level-3. If this is ALWAYS zero and "logger" queue has all the buffers then there is a problem. Contact CSL expert.

CSL history plots

File   Edit   View   Go   Communicator   Help

Back   Forward   Reload   Home   Search   Netscape   Print   Security   Shop   Stop

Bookmarks   Location: http://www-b0.fnal.gov:8000/~csl/   What's Related

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CSL home page
presentations
documentation
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monitor plots
useful links

Consumer–Server/Logger Monitoring Plots

CSL specific plots		
receiver, logger, consumer rates	24 hours	one week
number of events logged	24 hours and one week	
number of processes	24 hours	one week
number of messages in queues	24 hours	one week
average event size (partition 0–3)	24 hours	one week
average event size (partition 4–7)	24 hours	one week
CPU usage: receivers,loggers,conssends	24 hours	one week
CPU usage: driver,distributor,bufman,monsend	24 hours	one week
look area	24 hours	one week
general b0dau32 plots		
disk space usage	24 hours	one week
load average	24 hours and one week	
free memory	24 hours and one week	
CPU usage: global	24 hours	one week

List of files waiting to be copied to the lookarea

Accelerator Status

Calibration CSL

A special version of the CSL software runs on b0dap60. Useful for some calibration runs which require

- guaranteed delivery of all events to the consumer OR
- a very large event size
  (expected Run 2 event size is about 250 kB, official CSL can accept up to 3 MB, calibration CSL can accept up to 17 MB)

Calibration CSL does not log any data to disk.

Data File Catalog

CSL writes information into the Data File Catalog database for each output data file:

- file size
- total number of events in the file
- run number
- first event number in the file
- last event number in the file
- run section numbers

This must be done before the files are put onto tape.

Look Area on fcdfsgi2

To check status: on b0dau32 as user ace type "lookarea check"

Troubleshooting

Here are some reasons why you might think there is a problem with the CSL

- Level-3 is stuck in a "waiting to output events" state
- The CSL does not acknowledge a run control transition.
- There is an error message from the CSL in the Error Logger.
- You believe Level-3 or the software event builder is sending events to the CSL and one or more of the following is true
  · the consumers are not receiving any events
  · the events do not seem to be written to disk by the CSL
  · no files for the runs you are taking appear in the "look" area on fcdfsgi2

Some things you should check before paging a CSL expert:

- Is the CSL receiving any events?
- If the CSL is not receiving events...
- Is the CSL sending events to consumers?
- Is the CSL writing events to disk?
- Did the CSL send an error message to the Error Logger?

CSL ACE web pages describes how to answer these questions.

AFTER going through the checklist, if you still think there is a problem with the CSL, then page a CSL expert.